

CLAIMS

1. A method for manufacturing a multi-layered pulp-product, the method comprising

continuously providing fibre material from at least one entrance box of a pulp-product manufacturing machine; depositing the fibre material on at least one section of the pulp-product manufacturing machine, thereby obtaining at least two fibre meshes that form different layers of the fibre material at at least one layer forming section; draining said layers during their travel along at least one layer-forming section; introducing, by applicator means, a filler at least between said two layers of fibre material which is being moved by a conveyor means; and joining together at least said two layers of fibre material,

wherein the filler is selected from the group consisting of calcium sulphate, calcium carbonate, titanium dioxide, talc, kaolin, aluminum oxides, and combinations thereof.

2. Method according to claim 1, wherein the application means are in a variable position with respect to the formation section.

3. Method according to claim 1, wherein the fillers are introduced by the application means on one or another layer.

4. Method according to claim 1, wherein the introduction of filler is done at a distance of 1 to 70 cm on the moving fibre mesh.

5. Method according to claim 4, wherein the introduction of filler is done at a distance of 5 to 40 cm on the moving fibre mesh.

6. Method according to claim 1, wherein the application means of filler are located above the moving fibre mesh and arranged in one or several series of application means at different distances from the entrance box of the pulp product manufacturing machine.

7. Method according to claim 6, wherein the filler is introduced by means of one or several series of application means in successive layers.

8. Method according to claim 1, wherein the application means of filler are arranged at an angle of inclination with respect to the mobile fibre mesh plane comprised between 0 and 90 degrees.

9. Method according to claim 8, wherein the angle of inclination with respect to the plane of mobile fibre mesh is comprised between 0 and 45 degrees.

10. Method according to claim 1, wherein the filler is transferred to the mobile fibre mesh with an efficiency greater than 70%.

11. Method according to claim 10, wherein the filler is transferred to the mobile fibre mesh with an efficiency between 90% and 100%.

12. Method according to claim 1, wherein the mobile fibre mesh is displaced at a speed between 50 and 2000 metres per minute.

13. Method according to claim 1, wherein the introduction of filler is done by means of spraying.

14. Method according to claim 1, wherein the filler is introduced as a sprayed suspension in jets of conical or plane shape with variable angles of opening.

15. Method according to claim 14, wherein the angle of opening is 60 degrees.

16. Method according to claim 1, wherein the spraying of the filler is done on any of the layers of fibre material.

17. Method according to claim 1, wherein the filler is applied prior to the joining together the layers of fibre material with the pulp product.

18. Method according to claim 1, wherein the application means of the filler are nozzles.

19. Method according to claim 13, wherein the spraying is done by means of a system comprising nozzles and a return.

20. Method according to claim 19, wherein the flow in the nozzles is regulated by a control means and a return.

21. Method according to claim 20, wherein the flow control means in the nozzles are selected from a pressure regulator, a flow regulator and a pump equipped with a frequency shifter.

22 Method according to claim 1, wherein the filler penetrates inwards the moving fibre mesh with a depth that is determined by the distance of the application means of the filler with respect to the entrance box of the fibre material.

23. Method according to claim 1, wherein the manufacturing machine for the product is a paper or cardboard machine.

24. Method according to claim 23, wherein the paper or cardboard machine is selected from Fourdrinier-type machines, cylindrical machines and combinations thereof.

25. Method according to claim 1, wherein the filler is selected from inorganic origin, organic origin and mixtures thereof.

26. Method according to claim 1, wherein the calcium carbonate is selected from a natural calcium carbonate and a precipitated calcium carbonate.

27. Method according to claim 1, wherein said calcium sulphate is an anhydrous calcium sulphate selected from:

- natural anhydrous calcium sulphate,
- anhydrous calcium sulphate coming from chemical synthesis, and

- anhydrous calcium sulphate obtained by dehydration of a calcium sulphate selected from:
- natural calcium sulphate hemihydrate,
- natural calcium sulphate dihydrate,
- calcium sulphate dihydrate coming from chemical synthesis, and
- calcium sulphate hemihydrate coming from chemical synthesis.

28. Method according to claim 27, wherein said calcium sulphate is dispersed in water in proportions of up to 60% by weight in relation to the total mass of the suspension.

29. Method according to claim 28, wherein said anhydrous sulphate is dispersed by vigorous stirring.

30. Method according to claim 1, wherein the filler has a granulometry of between 0.5 and 50 μm .

31. Method according to claim 30, characterized in that the filler has a granulometry of between 1 and 5 μm .

32. Method according to claim 1, wherein the filler includes a dispersant in a proportion of between 0.01% and 1% by weight of the dry weight of the filler.

33. Method according to claim 1, wherein the filler is applied as an aqueous suspension consisting between 99% and 40% of water.

34. Method according to claim 33, wherein the filler is

applied as an aqueous suspension consisting between 90% and 70% of water.

35. Method according to claim 1, wherein the filler is applied controlling the flow by means of a flow regulator, by means of pressure control or by means of a flow regulator and pressure control.

36. Method according to claim 1, wherein the filler applied as aqueous suspension on then fibre mesh comprises between 0.5 g/m² and 50g/m² of dry extract.

37. Method according to claim 36, wherein the filler applied as aqueous suspension on then fibre mesh comprises between 5 g/m² and 15g/m² of dry extract.

38. Method according to claim 36, wherein filler comprises at least one more additive.

39. Method according to claim 38, wherein the filler contains different types of starches or mixtures of them.

40. Method according to claim 24, wherein fibre material is comprised of paste selected from among virgin paste, recycled paste, de-inked paste, not de-inked paste, all kinds of whitened paste, all kinds of not whitened paste, and mixtures thereof.

41. A multi-layer pulp product obtained by the method of claim 1.

42. A multi-layer product according to claim 41, which is selected from paper and cardboard.